NOV 19 1993

FLOOD INSURANCE STUDY

CITY OF CARROLLTON, KENTUCKY

CARROLL COUNTY

FEBRUARY 2, 1989

Federal Emergency Management Agency

COMMUNITY NUMBER 210232

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
1.1	Purpose of Study	1
1.2	Authority and Acknowledgments	1
1.3	Coordination	2
2.0	AREA STUDIED	2
2.1	Scope of Study	2
2.2	Community Description	2
2.3	Principal Flood Problems	2
2.4	Flood Protection Measures	2
3.0	ENGINEERING METHODS	4
3.1	Hydrologic Analyses	4
3.2	Hydraulic Analyses	5
4.0	FLOODPLAIN MANAGEMENT APPLICATIONS	5
4.1	Floodplain Boundaries	5
4.2	Floodways	6
5.0	INSURANCE APPLICATION	6
6.0	FLOOD INSURANCE RATE MAP	7
7.0	OTHER STUDIES	7
8.0	LOCATION OF DATA	7
9.0	REFERENCES AND BIBLIOGRAPHY	7

TABLE OF CONTENTS (continued)

Page

FIGURE

Figure 1 - Vicinity Map 3

TABLE

Table 1 - Summary of Discharges 4

EXHIBITS

Flood Profiles

Ohio River	Panel 01P
Kentucky River	Panel 02P

Flood Insurance Rate Map

Elevation Reference Marks

FLOOD INSURANCE STUDY

CITY OF CARROLLTON,
CARROLL COUNTY,
KENTUCKY

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises and supersedes a previous Flood Insurance Rate Map for the City of Carrollton, Kentucky (Reference 1). This information will be used by the community to update existing floodplain regulations as part of the regular phase of the National Flood Insurance Program. The information will also be used by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

This Flood Insurance Study was prepared by compiling existing hydrologic and hydraulic technical and scientific data prepared by the Federal Emergency Management Agency (FEMA) for purposes of the National Flood Insurance Program.

The data were identified as the best available at the time of compilation of this Flood Insurance Study and should depict the general conditions of the flooding sources with relative accuracy. The Federal Emergency Management Agency (FEMA) performed a cursory review and accepted the data as valid for purposes of this Flood Insurance Study and the National Flood Insurance Program. However, if better information is known to exist or has been developed since the date of this report, the information should be immediately forwarded to the Natural and Technological Hazards Division, FEMA, Atlanta, Georgia, for consideration for revision of this study.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were obtained from a U.S. Army Corps of Engineers (COE) report titled "Ohio River Profiles" (Reference 2).

The flood information for the Kentucky River was obtained from the COE, Louisville District (Reference 3).

1.3 Coordination

On February 25, 1988, the results of this Flood Insurance Study were reviewed and accepted at a final coordination meeting attended by representatives of the community and FEMA.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the City of Carrollton, Carroll County, Kentucky. The area of study is shown on the Vicinity Map (Figure 1).

The areas studied by detailed methods were selected based on the extent and validity of available existing hydrologic and hydraulic data.

Flooding caused by overflow of the Kentucky River and the Ohio River was studied in detail.

Areas having low development potential or minimal flood hazards were previously studied using approximate analyses. The results were shown on the Flood Insurance Rate Map for the City of Carrollton (Reference 1) and are incorporated into this Flood Insurance Study.

2.2 Community Description

The City of Carrollton is in northern Carroll County, Kentucky, along the Ohio River. Carrollton is east of the Town of Prestonville, across the Kentucky River. Carrollton is bordered on the north by the Ohio River, on the east by the Kentucky River, and is surrounded by the unincorporated areas of Carroll County. The city is served by State Routes 320 and 36, U.S. Route 42, and the Carrollton Railroad. The 1980 population of Carrollton was reported to be 3,967 (Reference 4), a 2.1-percent increase from the 1970 population of 3,884.

2.3 Principal Flood Problems

Records of damaging floods in the City of Carrollton began as early as 1884. In this century, devastating floods occurred in March 1913, January 1937, March 1945, April 1948, and, most recently, in March 1964. These floods ravaged the Ohio River basin, causing great economic losses and considerable loss of life. The January 1937 flood was the worst flood disaster ever experienced on the Ohio River in the area of Carrollton.

2.4 Flood Protection Measures

The COE has constructed a number of reservoirs upstream of the City of Carrollton. The reduction in flow due to the reservoirs is reflected in this study.

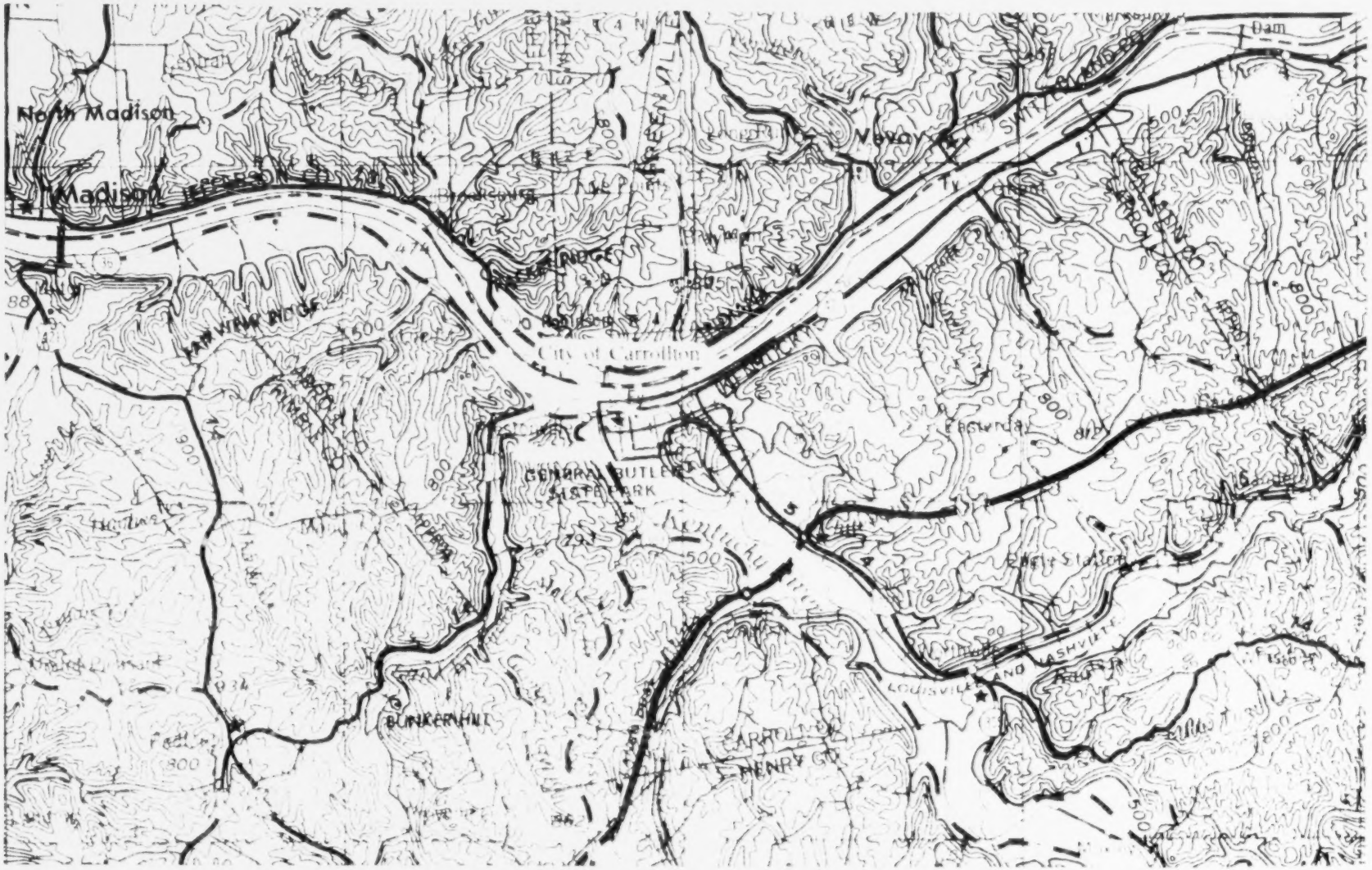


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CARROLLTON, KY

(CARROLL CO.)

APPROXIMATE SCALE

VICINITY MAP

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that is expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried cut to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the community.

Peak discharge-drainage area relationships for the 100-year floods of each flooding source studied in detail in the community are shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (cfs*) 100-YEAR
OHIO RIVER		
just upstream of confluence of Kentucky River	N/A	760,000
just downstream of confluence of Kentucky River	N/A	812,000
KENTUCKY RIVER		
just upstream of mouth	N/A	113,850

*cubic feet per second

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles.

Channel roughness factors (Manning's "n") used in the hydraulic computations were chosen on the basis of field observation. Roughness values for the Ohio River are 0.029 for the channel and 0.040 for the overbank. Values for the Kentucky River are 0.032 for the channel and 0.050 for the overbank.

The slope-area method was used to determine water-surface elevations for the Ohio River.

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24000 with a contour interval of 10 feet (Reference 5).

The 100-year floodplain boundaries are shown on the Flood Insurance Rate Map. On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, AH, AO, A99, V, and VE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary was delineated using the Flood Insurance Rate Map for the City of Carrollton (Reference 1).

4.2 Floodways

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights.

Floodways have not been shown or computed for this community. Along streams where floodways have not been computed, the community must ensure that the cumulative effect of development in the floodplain will not cause more than a 1.0-foot increase in the base flood elevations at any point within the community.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 100-year floodplain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols the 100- and 500-year floodplains, the floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

Due to its more detailed analysis this Flood Insurance Study supersedes the previously printed Flood Insurance Rate Map for the City of Carrollton (Reference 1).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, 1371 Peachtree Street, NE., Suite 736, Atlanta, Georgia 30309.

9.0 REFERENCES AND BIBLIOGRAPHY

1. Federal Emergency Management Agency, Flood Insurance Rate Map, City of Carrollton, Carroll County, Kentucky, September 1985.

2. U.S. Army Corps of Engineers, Ohio River Division, Ohio River Profiles, Cincinnati, Ohio, January 1981.

3. ————, Louisville District, Open-File Report, Floods on Kentucky River in the Vicinity of Carrollton, Kentucky, 1986.

4. U.S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Kentucky, Washington, D.C., February 1982.

5. U.S. Geological Survey, 15 Minute Series Topographic Maps, Scale 1:24000, Contour Interval 10 Feet: Carrollton, Kentucky, 1967.

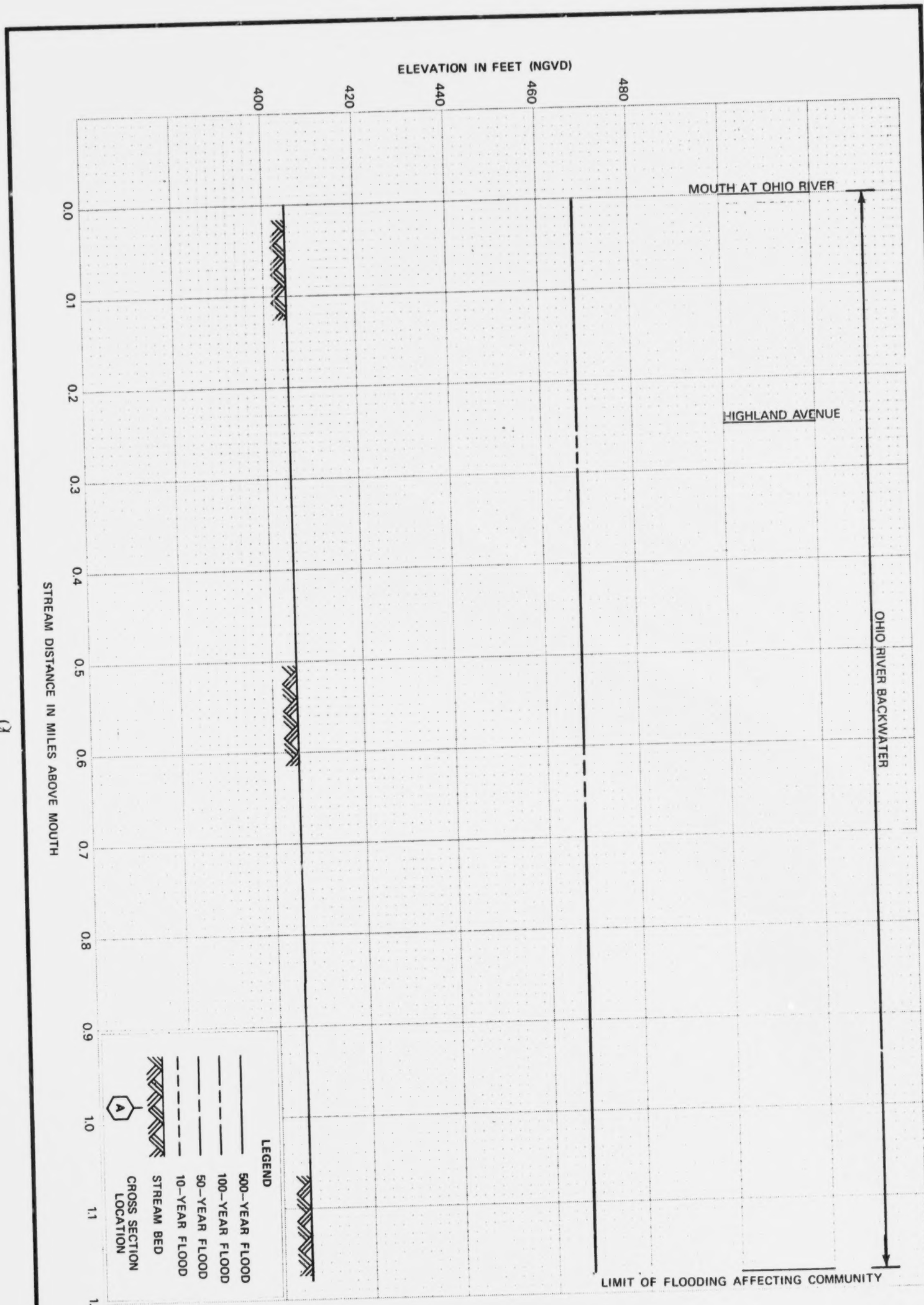
FLOOD PROFILES

OHIO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF CARROLLTON, KY
(CARROLL CO.)

01P



02P	FEDERAL EMERGENCY MANAGEMENT AGENCY **CITY OF CARROLLTON, KY** (CARROLL CO.)	**FLOOD PROFILES** **KENTUCKY RIVER**